

Automated Traffic Signal Performance Measures

AASHTO Innovation Initiative (formally TIG) **2013 Focus Technology**

Mission: Investing time and money to accelerate technology adoption by agencies nationwide

- Each year the program selects highly valuable technologies, processes, software, or other innovations that have been adopted by at least one agency, are proven in use, and will be a significant benefit to other agencies.



Automated Traffic Signal Performance Measures

AASHTO Innovation Initiative (formally TIG) 2013 Focus Technology

Lead States Team



Automated Traffic Signal Performance Measures

AASHTO Innovation Initiative (formally TIG)

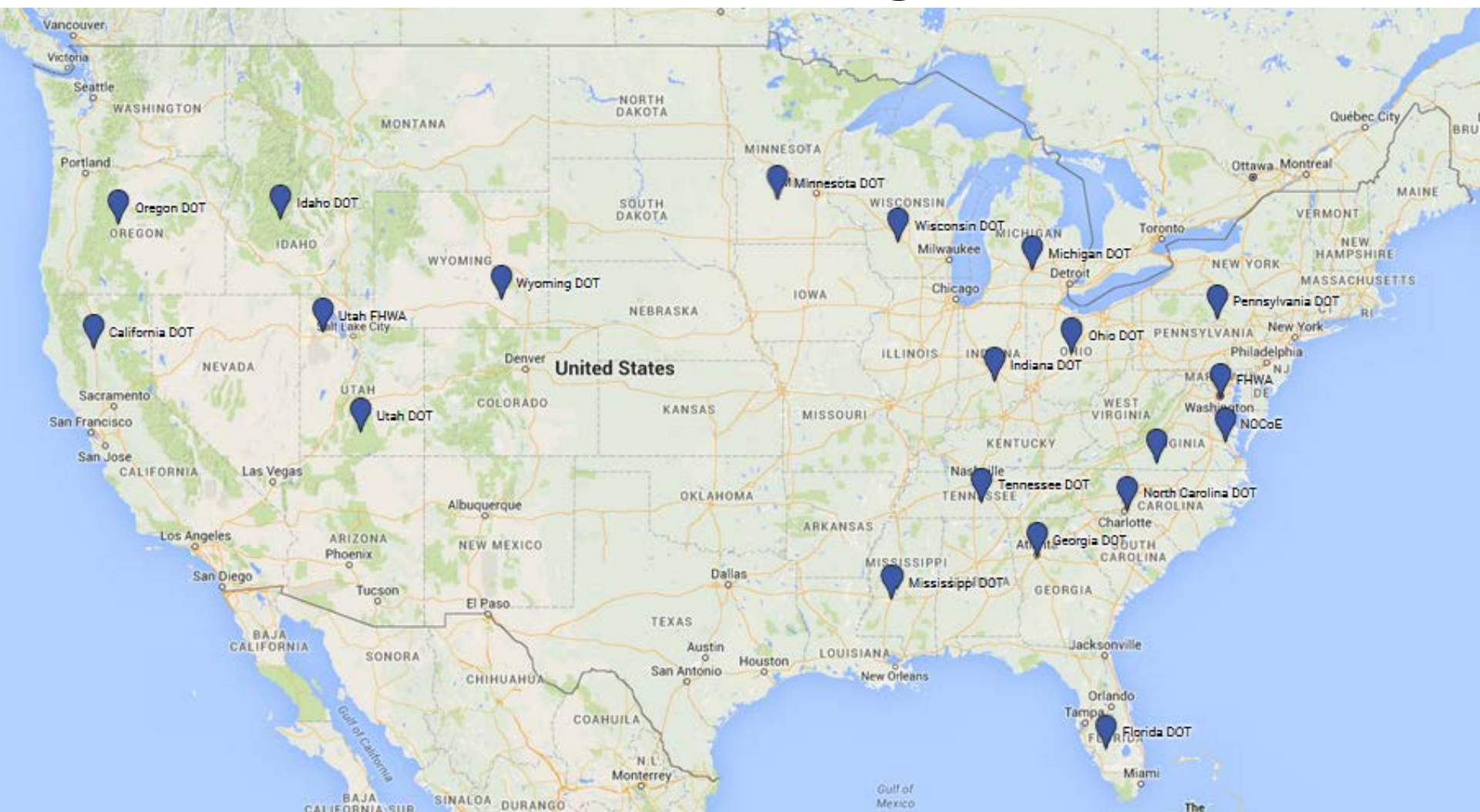
2013 Focus Technology

Accomplishments

- ✓ Presented at several conferences nationwide.
- ✓ ITE Journal article & series of webinars.
- ✓ Worked with equipment vendors incorporating hi-def.
- ✓ Improved the source-code & added additional SPM's.
- ✓ Installed SPMs for several jurisdictions.
- ✓ SPM Workshop.

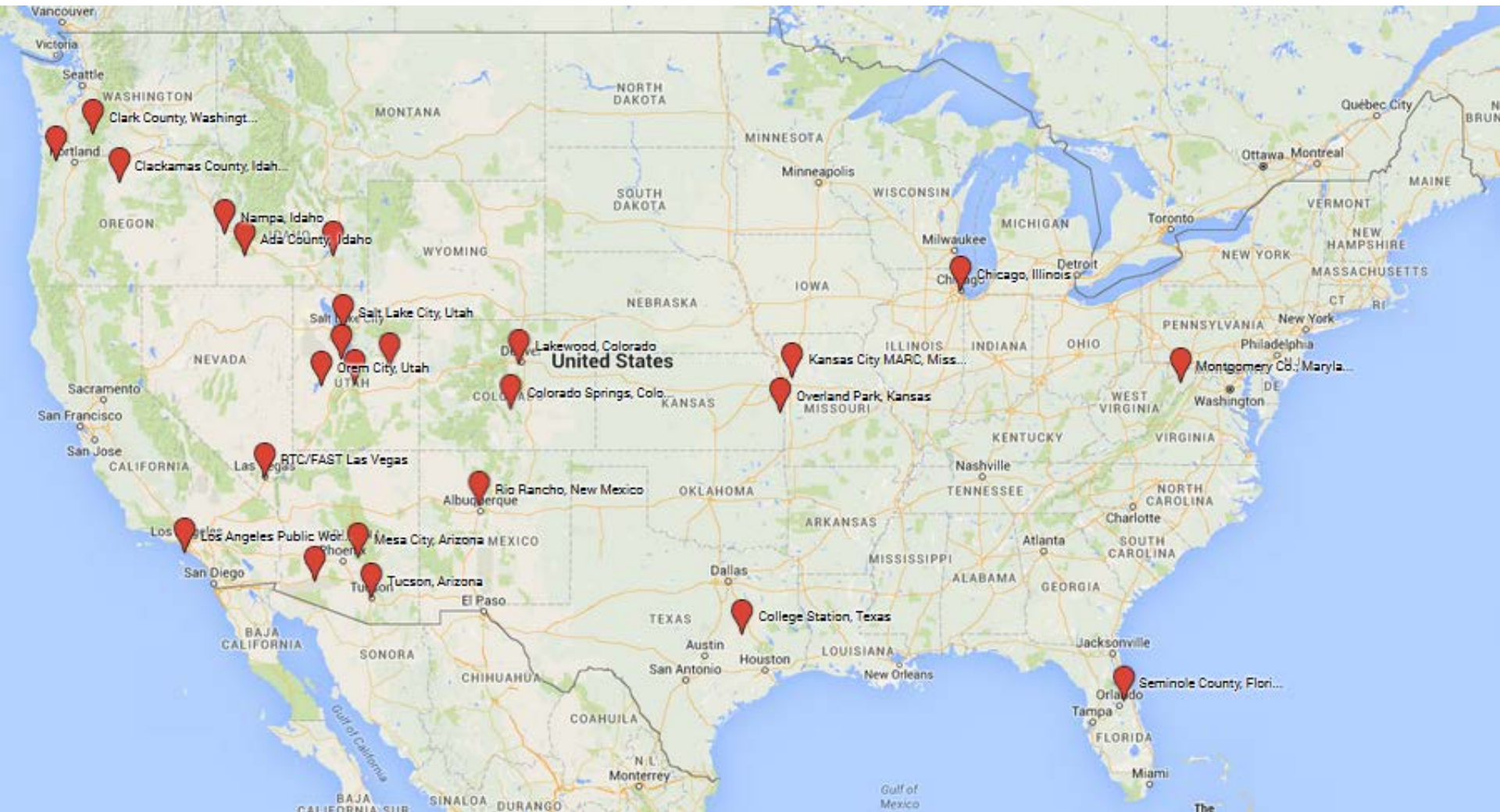


SPM Workshop State & Federal Agencies



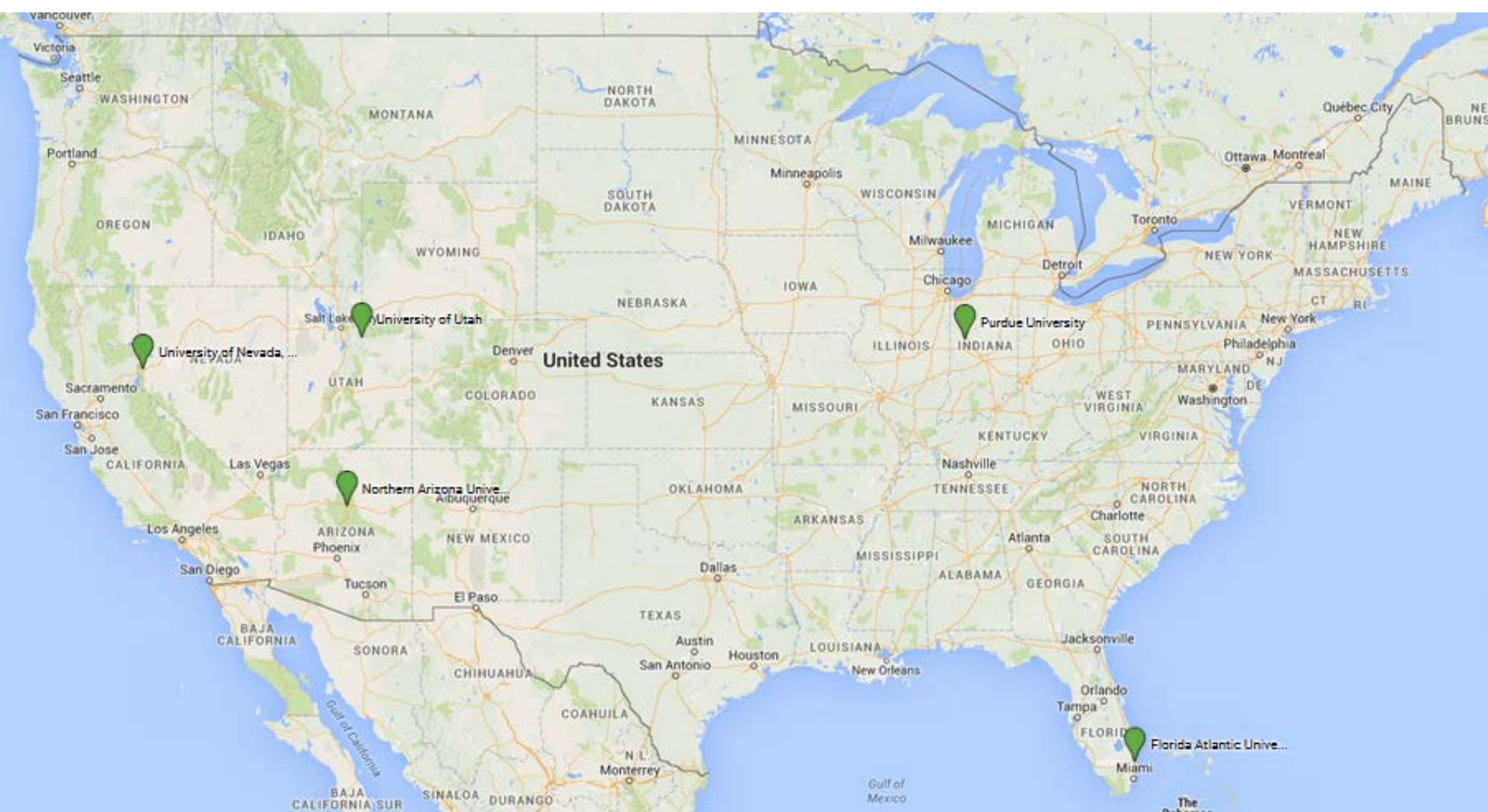
Representation from 20 State & Federal Agencies

SPM Workshop Public Agencies



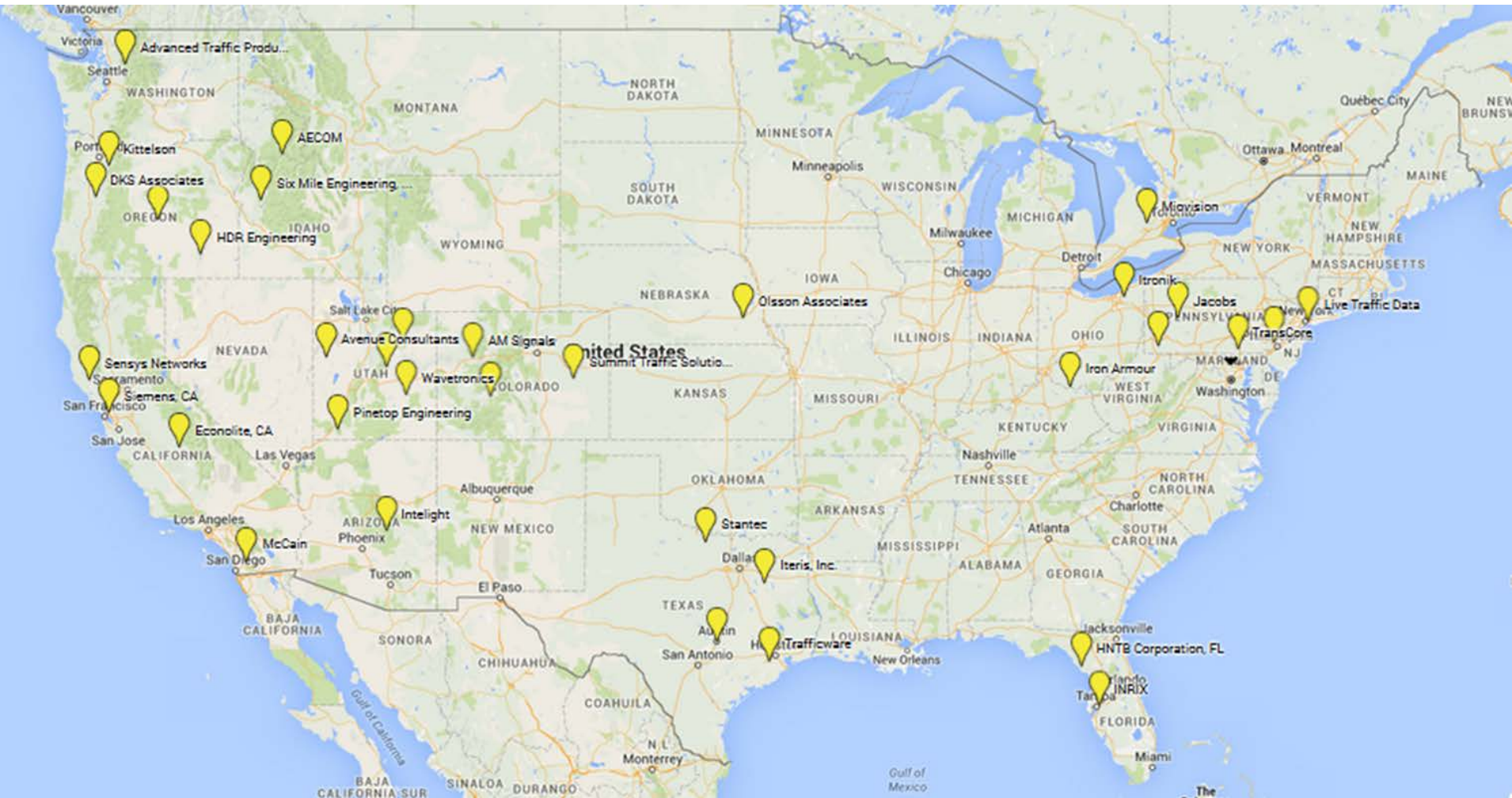
Representation from 25 Public Agencies

SPM Workshop Universities



Representation from 5 Universities

SPM Workshop Private Sector



Representation from 35 Private Sector Locations

SPM Workshop Participants



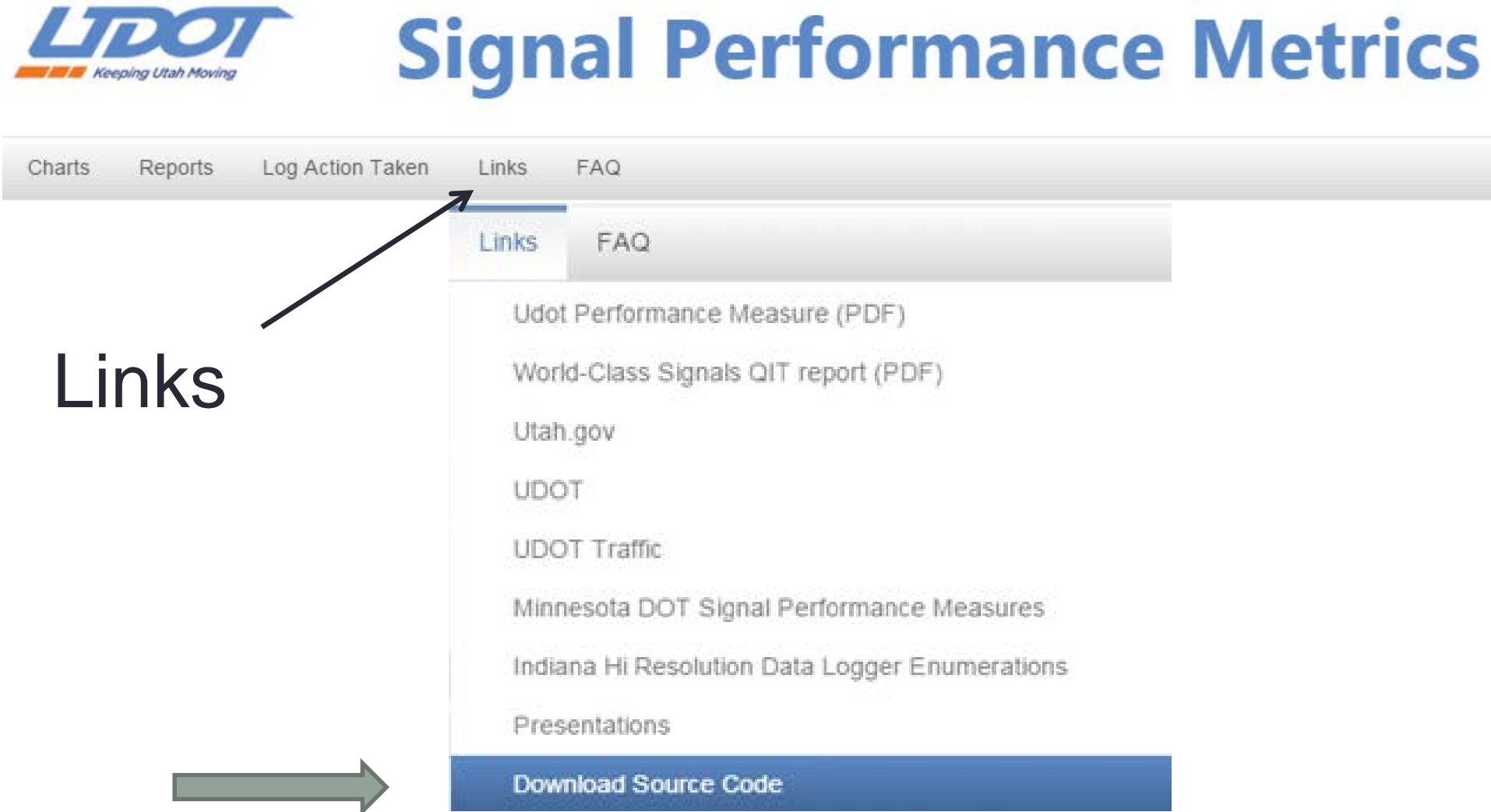
169 Representatives from 85 Different Organizations, 28 States, DC, & Canada

Obtaining SPMs

- ❖ Everyone should have SPMs!
- ❖ In process of hiring a technical writer for improved source code documentation.
 - Document logic on building algorithms.
 - How the different pieces work together.
 - Database to web server; services to website, etc.
- ✓ We are **committed** in making available our source code for free to anyone who wants it.
 - Why reinvent the wheel?



Obtaining SPM Source Code





The screenshot shows the UDOT Signal Performance Metrics website. The UDOT logo is in the top left. The main title 'Signal Performance Metrics' is in large blue font. Below it is a navigation bar with links: Charts, Reports, Log Action Taken, Links, and FAQ. The 'Links' link is highlighted with a blue underline. A black arrow points from the word 'Links' (written in large black font to the left of the page) to the 'Links' link in the navigation bar. Below the 'Links' link, a dropdown menu is open, listing several items: Udot Performance Measure (PDF), World-Class Signals QIT report (PDF), Utah.gov, UDOT, UDOT Traffic, Minnesota DOT Signal Performance Measures, Indiana Hi Resolution Data Logger Enumerations, and Presentations. At the bottom of this dropdown menu is a blue button labeled 'Download Source Code'. A grey arrow points from the bottom left towards this button.

Links

- Charts
- Reports
- Log Action Taken
- Links**
- FAQ

- Udot Performance Measure (PDF)
- World-Class Signals QIT report (PDF)
- Utah.gov
- UDOT
- UDOT Traffic
- Minnesota DOT Signal Performance Measures
- Indiana Hi Resolution Data Logger Enumerations
- Presentations
- Download Source Code**

SPM Source Code Free to Public



Signal Performance Metrics

Download Agreement

Company Name

Address

Phone Number

Email Address

Accept ☐

You accept and agree to the terms of this Waiver by free to the public. UDOT makes no representations completeness of the data. UDOT is providing the int and employees from all claims, damages (including action of every kind, nature and character, known you have the authority to agree to this Waiver.

DOWNLOAD

Obtaining SPMs

➤ Installations take 1-2 days

- It's equivalent to setting up a central system
- Upgrades take just as long

➤ We request the private sector integrate and support SPM's.

- We will provide private sector training (as needed)
- If demand for private sector support becomes burdensome, we may schedule a set time & location for training and support.
 - Semi-annual?, In Utah?
- May consider a link on our SPM site of qualified consultants who can provide the support.

National Traffic Signal

Report Card

**Proactive
Management**

F

**Signal Operation in
Coordinated Systems**

D-

**Signal Operation at
Individual Intersections**

C-

Detection Systems

F

Maintenance

D+

OVERALL

D-

NTOC

D Grade =
***Headaches
for
Commuters***

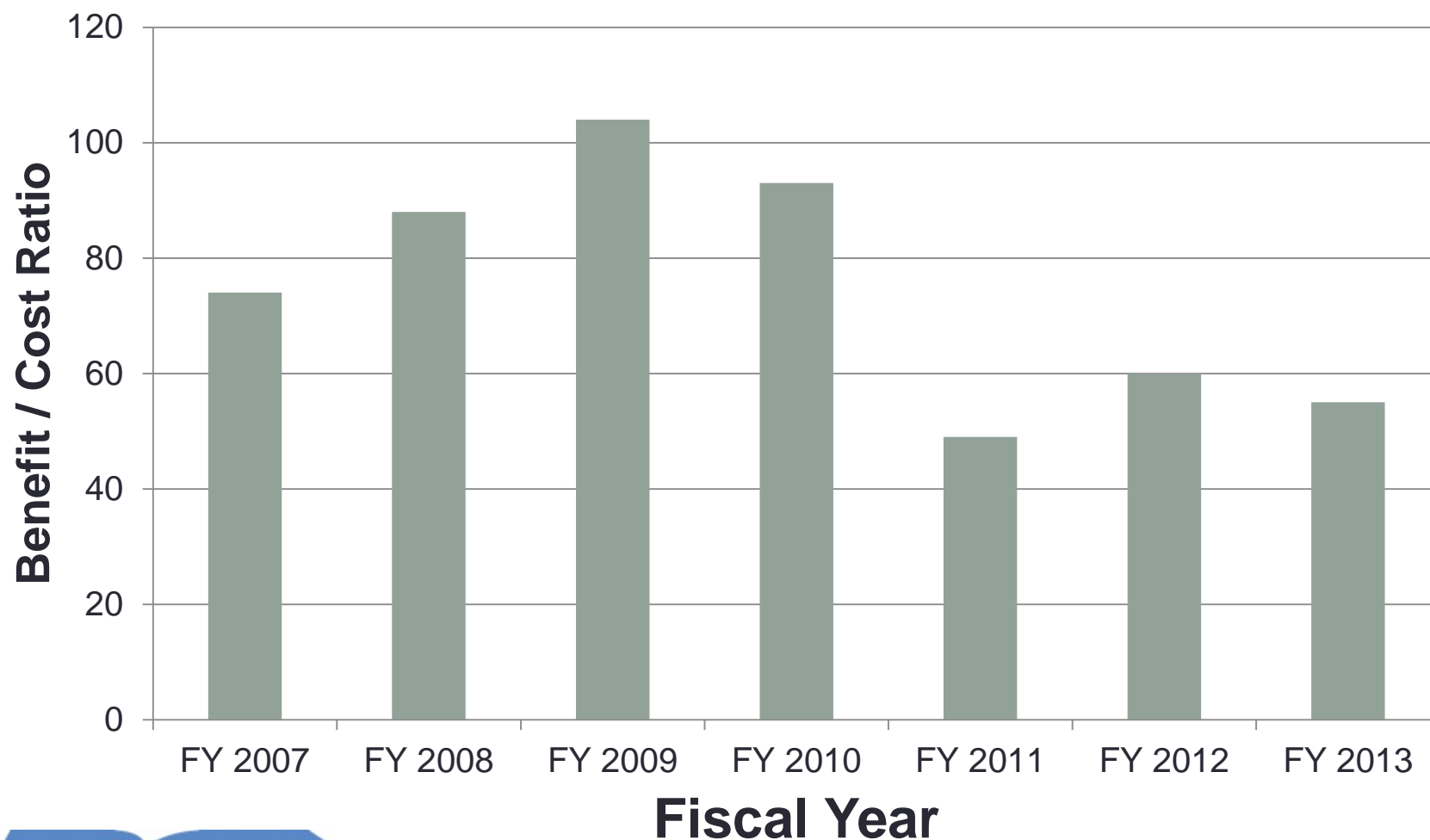
**UDOT (2005):
C- Overall**

National Traffic Signal Report Card

- ❖ Delays at traffic signals contribute 5% to 10% of all traffic delay on major roadways alone.
- ❖ Benefit-Cost Ratios exceed 40:1
 - What else is higher?
 - These are inexpensive solutions

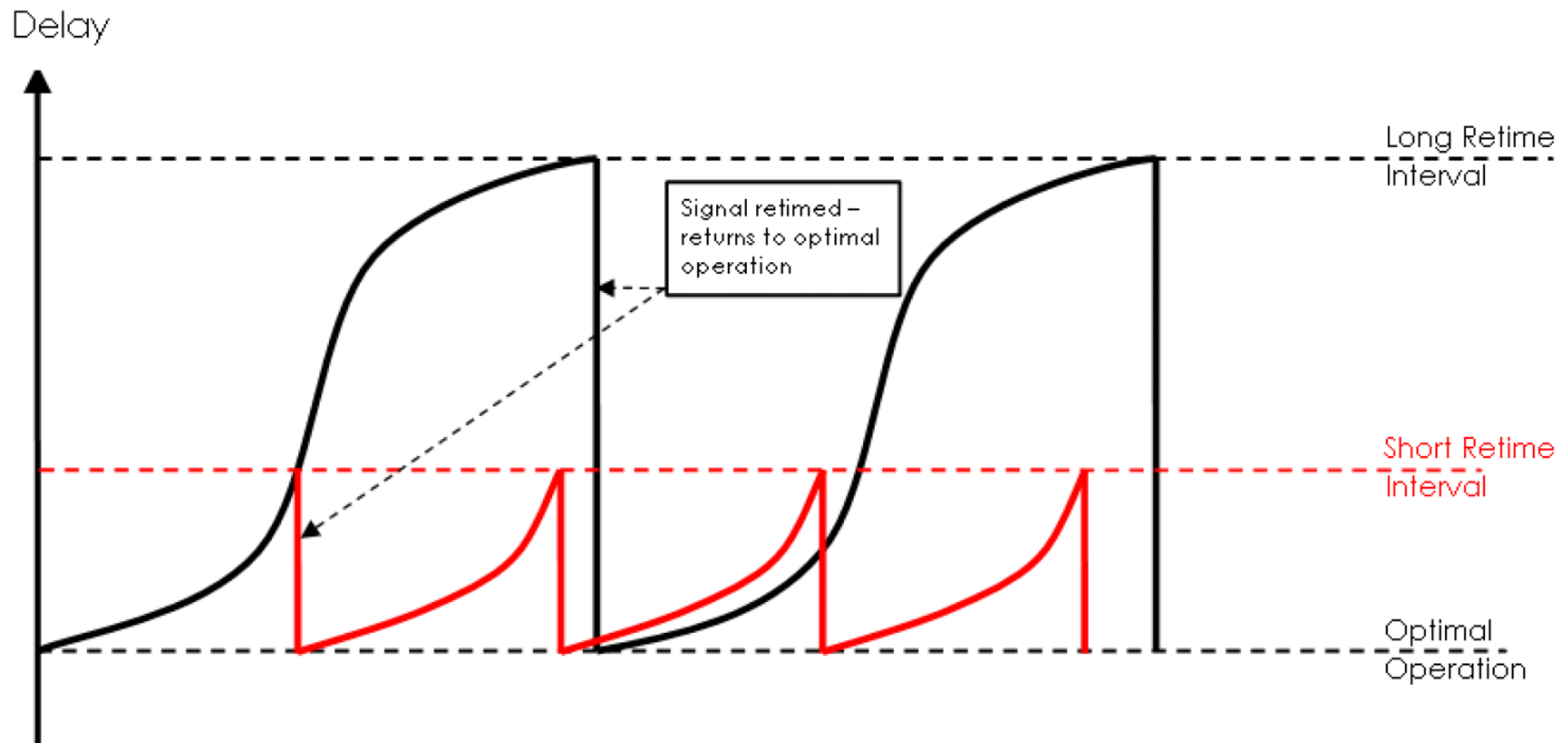


Before & After Signal Coordination Results



Delay vs Time in Retiming Signals

- Signals should be retimed more frequently



Opportunity – UDOT Executive Leaders - 2011

“What would it take for UDOT’s traffic signals to be World-Class?”

“What’s the trend – are signal operations improving, staying the same or getting worse?”

“What are our areas of most need?”

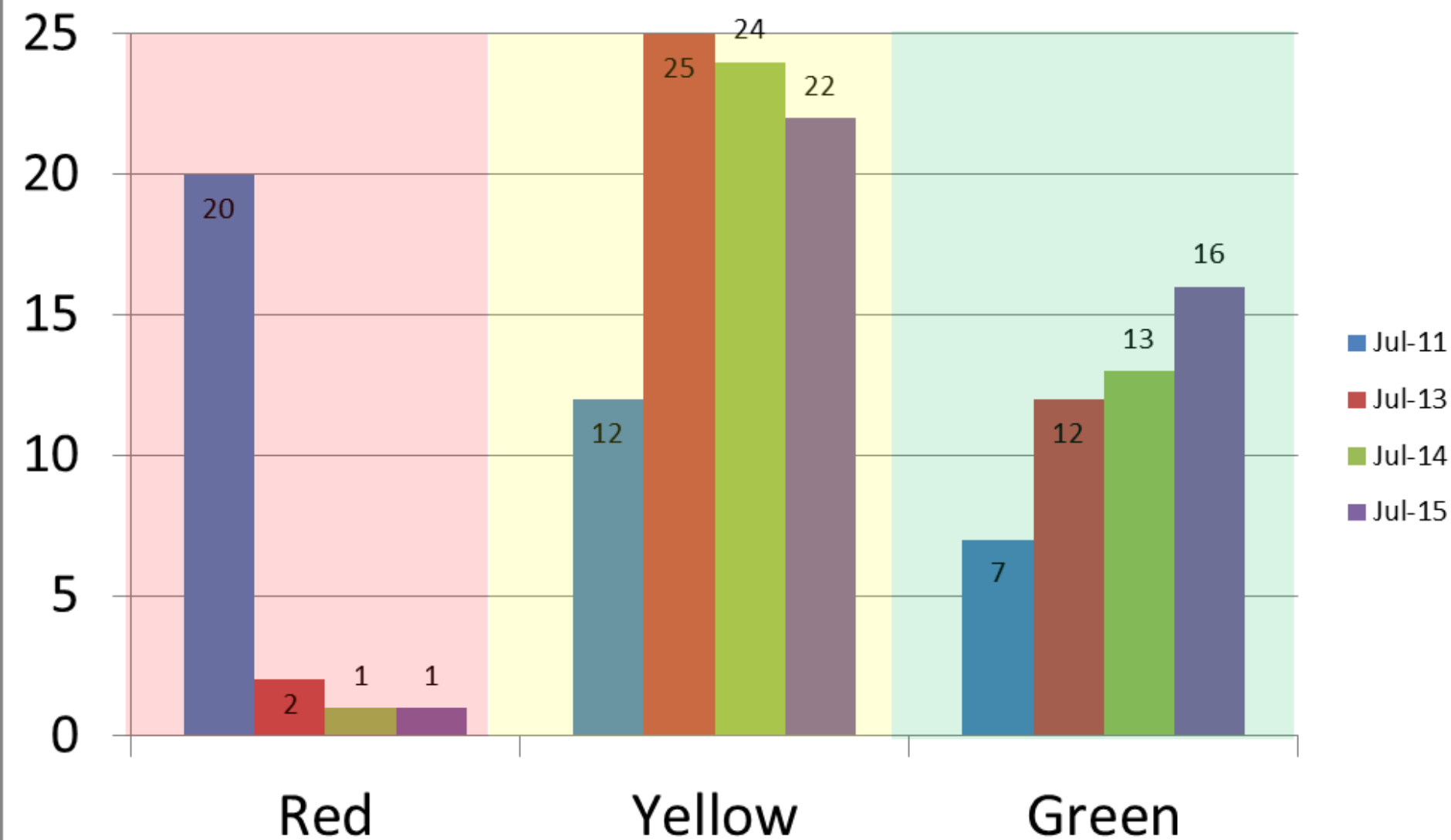


John Njord



Carlos Braceras

UDOT Annual Self Assessment - Best Practices



UDOT Asset Management (A.M.) Tiers

- A.M. Tiers range from 1 to 3
- Tier 1 assets:
 - Highest value combined with highest risk of negative financial impact for poor management.
 - Very important to UDOT.
 - Receive separate funding source.
 - Targets and measures are set and tracked.

Tier 1 Assets

Pavement

Bridges

ATMS / Signal Devices

Tier 2 Assets

Pipe Culverts

Signs

Barriers & Walls

Rumble Strips

Pavement Markings

Tier 3 Assets

Cattle Guards

Interstate Lighting

Fences

Curb & Gutter

Rest Areas

UDOT Signal Timing Focus Group (July 2014)

- Two 2-hour groups
- Participants
 - Mix of ages 25-55
 - Drive 3 or more times per week
 - Have driven outside of Utah
- Group 1: Female drivers
- Group 2: Male drivers



Focus Group Room

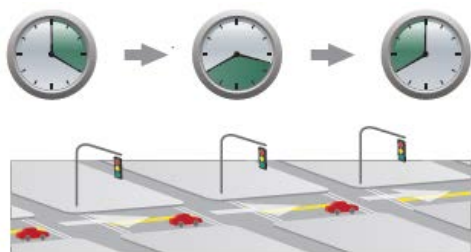


Observation Room

Focus Group Key Findings (July 2014)



UDOT is perceived positively, with innovation as the primary driver of positive impressions.



Drivers believe traffic signal synchronization is improving.



Drivers feel UDOT should be open about its accomplishments in a way that protects its credibility.

60 S Commercial – Green Lights



Questions?

Rob Clayton

